

REMARKS

The examiner is thanked for a thorough search. No claims have been amended, cancelled or added. Hence, Claims 1-9 are pending in the Application. Each issue raised in the Office Action mailed March 24, 2004 is addressed hereinafter.

SUMMARY OF REJECTIONS/OBJECTIONS

I. Issues Not Relating to Prior Art

The Office Action has objected to the title of the invention. Accordingly, Applicant submits that the title has been amended to read: “ A Method and Apparatus for Managing a Plurality of Data Communication Connections having Differing Data Communication Rates.”

Next, the Office Action states, “Applicant is reminded of the language and format for an abstract of the disclosure.” Applicant respectfully submits that the abstract is exactly 150 words, limited to a single paragraph on a separate sheet of paper, does not use any legal phraseology or form often used in patent claims, and sufficiently describes the disclosure.

II. Issues Relating to Prior Art

Claims 1-9 were rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,076,112 to Hauser et al. (“*Hauser*”) in view of US Patent No. 6,324,165 to Fan, et al. (“*Fan*”). To establish a *prima facie* case of obviousness, there must be some suggestion or motivation to combine reference teachings. Second, there must be a reasonable expectation of success, and finally, the prior art references must teach or suggest all the claim limitations. MPEP §2142. Applicant respectfully submits that there

is no suggestion to combine *Hauser* and *Fan*. Further, the combination of *Hauser* and *Fan* does not teach every element of the claimed invention. Therefore, the Office Action fails to present a *prima facie* case of obviousness, and the rejection of Claims 1-9 under §103(a) is respectfully traversed.

First, Claim 1 recites:

A method of managing a plurality of data communication connections having differing data communication rates, comprising:

- A) assigning said data communication connections to a plurality of buckets that have a circular order;
- B) establishing a bucket of said plurality of buckets as a current bucket and establishing another bucket as a fast bucket;
- C) establishing a connection assigned to said current bucket as a current connection;
- D) communicating data over said current connection;
- E) in response to communicating data over said current connection, re-assigning said current connection to a different bucket of said plurality of buckets based upon where said current bucket resides in said circular order and a bandwidth estimation of said current connection;**
- F) repeating steps (C), (D) and (E) for each connection assigned to said current bucket;
- G) establishing a next bucket as a new current bucket, wherein said next bucket follows said current bucket in said circular order; waiting until the earlier of (1) when any connection in the fast bucket is ready for communication or (2) when a pre-defined period of time elapses; and repeating step (F) and (G) for each bucket of said plurality of buckets.

(Emphasis added)

Importantly, element (G) of Claim 1 is emphasized. The ability to re-assign connections to different buckets of a plurality of buckets based upon where the currently selected bucket resides in circular order and a current estimation of the bandwidth of the current connection is not taught by *Hauser*, *Fan* or their combination.

First, *Hauser* does not teach re-assigning connections to different buckets. In fact, it is quite clear that *Hauser* does not teach the re-assigning of connections to different buckets because each connection is permanently assigned to a single buffer resource. Particularly, *Hauser* teaches “ the ability to partition a buffer resource among multiple prioritized buffer subsets” wherein “ **the buffer resource [is] shared by a plurality of connections.**” (*Hauser*, Abstract). However, Claim 1 requires a plurality of connections assigned to a **plurality of buckets**. Although the shared buffer resource in *Hauser* is divided into buffer subsets, the connections maintain the same buffer subset throughout the processes described in *Hauser*. Therefore, *Hauser* does not teach the method of **re-assigning connections** among a **plurality of buckets**.

In fact, the “buckets” of Claim 1 and the buffer subsets of *Hauser* are functionally different and serve dissimilar purposes. For instance, *Hauser* teaches the initialization of buffer counters and the **setting of buffer limits for each connection** (See *Hauser*, Col. 5, lines 23-29). Before transmitting data, the “transmitter” in *Hauser* determines which connection has a cell ready to transmit, a number of data cells in transmission or not yet released by the buffer smaller than the **allocated buffer amount**, and that the connection is next in order to “send.”(See *Hauser*, Col 5, lines 35-40) Thus, it is clear that the buffer subsets in *Hauser* act as portions of the shared buffer resource allocated to each connection. However, the “buckets” of Claim 1 are not allocated portions of a buffer resource at all. Rather, the “buckets” of Claim 1 are groupings of connections such that

each bucket in the circular order may hold a plurality of connections. This grouping of connections into buckets allows certain connections to be polled at certain times.

Even if the buffer subsets of *Hauser* are analogous to the buckets of Claim 1, which they are not, there is no language in *Hauser* that suggests the re-assigning of the connections to a different bucket in a circular order of buckets. The only change to a buffer subset taught by the system in *Hauser* is that the size of each buffer subset may be changed per connection (*Hauser*, Col. 11, Lines 1-14). In contrast, the method of Claim 1 **re-assigns connections to different buckets** in order to more efficiently poll connections based on their data communication rates. Therefore, *Hauser* does not teach a plurality of buckets, nor teaches re-assigning connections to a different bucket in the plurality of buckets.

Also, the Office Action's attempt to analogize the function of reassigning connections to different buckets and the use of buffer counters in *Hauser* is misplaced. The buffer counters in *Hauser* are incremented to update the transmitting element with a more accurate indication of buffer availability for that connection. (*Hauser*, Col 6, Lines 62-67) Thus, the buffer counters in *Hauser* are incremented merely to indicate buffer availability for each connection, and do not cause the connections to be re-assigned to different buckets in a circular order as required by Claim 1.

This difference is significant because having a plurality of buckets in circular order allows connections to be re-assigned to different buckets in a different order. Further, the circular order allows connections to be re-assigned based on a bandwidth estimation of the current connection, thus allowing for connections to be polled more efficiently. *Hauser* does not teach re-assigning connections to different buckets based upon "where the current bucket resides in said circular order and a **bandwidth**

estimation of said current connection.” Therefore, *Hauser* cannot teach re-assigning a current connection to a different bucket of a plurality of buckets based upon where the current bucket resides in a circular order and **a bandwidth estimation of the current connection.**

Also, the Office Actions attempt to analogize the “closed-loop feedback control” of *Fan* and the buckets of a circular order in Claim 1 is erroneous. The “closed-loop feedback control” of *Fan* is only used to detect the total available bandwidth of the system more accurately. (*See Fan*, Col.11, lines 45-47). In contrast, the function of the circular order of the buckets in Claim 1 is not used to detect the total available bandwidth of the system as taught by *Fan*. Rather, the buckets of a circular order in Claim 1 are groupings of connections, and the circular order of the buckets allows each grouping of connections to be polled at different intervals. Thus, the functions of the “closed-loop feedback control” of *Fan* and the buckets of a circular order in Claim 1 are completely different.

Regardless, even if the “closed-loop feedback control” of *Fan* is analogous to the circular order of buckets in Claim 1, which it is not, *Fan* does not teach the re-assignment of each connection to a different bucket in the circular order of buckets. Instead, *Fan* only teaches the limiting of the peak rate of each connection so that no connection uses more bandwidth than its assigned share (*Fan*, Col. 10, line 65).

Thus, there is no teaching in *Fan* of re-assigning connections to different buckets. More importantly, *Fan* teaches that **connections are served in First-In First-Out (“FIFO”) order.** (*Fan*, Col. 11, lines 26-27). In contrast, the method of Claim 1 does not serve connections in FIFO order, because **each connection is re-assigned to one of a plurality of buckets**, and the order in which each connection is served is based upon the

circular order of the buckets and a bandwidth estimation of the connections themselves. Hence, the connections in Claim 1 will be served in a variable order according to which bucket each connection is re-assigned to, and not in FIFO order as taught by *Fan*. This difference is significant because the connections of Claim 1 may be served more efficiently at intervals that correspond to their data communication rates. Therefore, because *Fan* teaches the serving of connections in FIFO order, it cannot logically teach the re-assigning of each connection to a different bucket in a circular order of buckets.

Therefore, because neither *Hauser* nor *Fan* teach every element of Claim 1, the rejection of Claim 1 under §103(a) is respectfully traversed. Moreover, independent Claims 4 and 7 each recite limitations similar to those discussed above as to Claim 1. Therefore, it is respectfully submitted that the rejection of Claims 4 and 7 under § 103(a) is traversed for at least the same reasons discussed above as to Claim 1.

III. Pending Claims

The pending claims not discussed so far are dependant claims that depend on an independent claim that is discussed above. Because each of the dependant claims include the limitations of claims upon which they depend, the dependant claims are patentable for at least those reasons the claims upon which the dependant claims depend are patentable. Removal of the rejections with respect to the dependant claims and allowance of the dependant claims is respectfully requested. In addition, the dependent claims introduce additional limitations that independently render them patentable. Due to the fundamental difference already identified, a separate discussion of those limitations is not included at this time.

For the reasons set forth above, Applicant respectfully submits that all pending claims are patentable over the art of record, including the art cited but not applied. Accordingly, allowance of all claims is hereby respectfully solicited.

The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

No extension fee is believed to be due. However, to the extent necessary, Applicants petition for an extension of time under 37 C.F.R. § 1.136. The Commissioner is authorized to charge any fee that may be due in relation to this application to our Deposit Account No. 50-1302.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

on 6/24/04 by Wesley